UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

MONTHLY REPORT

OFFICE OF FOREST EXPERIMENT STATIONS AND DENDROLOGY

MAY 1924

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Reports
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OFFICE OF FOREST EXPERIMENT STATIONS AND DENDROLOGY

~~June, 1924~~
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FOREST EXPERIMENT STATIONS

Washington

The most interesting event of the month was the passage of an increase of $50,000 by Congress for Forest Experiment Station work. This new increase, according to the expressed desire of Congress, is to be spent in the establishment of a station in the Pacific Northwest, to be known as the Pacific Northwestern Forest Experiment Station. The other half of the increase is to go to the Southern Forest Experiment Station for a material enlargement of its work.

We are very glad indeed to welcome to our family the new station in the Pacific Northwest, and we are happy also to see our child of the South develop suddenly into a youth of large proportions.

With this increase comes also the work of an increase which will provide for reclassification, as far as increases are concerned, in the field force.

The bills introduced for Experiment Stations in other regions, or for increases in appropriations for other regions, failed to materialize, so that the work will apparently remain on the same plane as it has been this past year.

The Section of Forest Measurements spent most of the month in completing a number of miscellaneous jobs. The southern pine data were rechecked in order to eliminate as far as possible the wide divergencies which had shown up, and the tentative stand and yield figures on this new basis were compiled. It now appears as if additional field data are necessary to complete the study, particularly in the case of loblolly and shortleaf. Considerable progress was made in the western yellow pine volume table study.

A number of card forms for the machine tabulator have been secured, and the supply of available second-hand punches has been exhausted. A number of the field stations have procured punches, and plan on preparing considerable data during the coming season in order

to take advantage of slack time, and the usefulness of the machine. Plans have also been perfected for taking over the accounting work of the Service on this tabulator. Although ordered for delivery in August, the machinery arrived early in the month.

In order to assist in the work of the office, the assistance of Professor Bruce was secured for this summer at least. Bruce will take on his new duties some time in June.

During May, Mr. E. F.McCarthy from the Appalachian Forest Experiment Station has been in Washington, assisting in the Office of Experiment Stations. Mr. McCarthy has been engaged chiefly in completing the minutes of the Madison Conference, and putting these in shape for mimeographing and distribution.

Mr. Herman Krauch, of the Southwestern Forest Experiment Station, returned to Flagstaff early in the month after having spent most of April in Washington working with the Editor, and in the Office of Forest Experiment Stations, in completing a manuscript on "Increment of Western Yellow Pine." Mr. Krauch also assisted Mr. Brown in the office of Forest Measurements.

Following telegraph dispatches from D-1 as to the seriousness of the fire situation due to an unprecedented spring drought, arrangements were made with Dr. Marvin of the Weather Bureau for sending forecasts of fire weather direct to the Forest Supervisors, District Forester, and the Priest River Forest Experiment Station, from Chicago. Dr. Marvin is taking quite an interest in the development of fire weather forecasting, and has been very much interested in the work of the Forest Experiment Stations, particularly in what might be termed Forest Fire Meteorology. Dr. Bowie of the Weather Bureau, who has been taking an active interest this year in our fire weather work, is being transferred to San Francisco, where it is expected that he will add materially in pushing this phase of our research work. Through contributed funds, the Weather Bureau will place a man in the Northwest to work upon the fire weather problem.

Mr. Clapp early in May made a trip to the Laboratory, and to the Lake States Station. At the Laboratory he went over the investigative program for the coming year. From Madison he went to Duluth and Cloquet, where he attended the meetings of the Lake States Experiment Station Advisory Council and discussed with them the program of work of the Station for the coming year.

We received a visit from Dr. Carl La Rue, who recently returned from a trip to Central and South America in the interest of the rubber investigation. Dr. La Rue was introduced to us by Dr. Hartley of the Bureau of Plant Industry, and there was discussed with these men, and with Mr. Sudworth and Mr. McCarthy, the advisability of beginning a study of genetics as applied to tree growth. The discussion chiefly centered around increasing the rate of growth of some of our important forest trees through breeding tests and securing greater immunity to diseases

through developing strains of trees capable of resisting these attacks. Some of the suggestions made were that we should work toward the increased productivity of the aspen and cottonwood for pulp purposes, and increasing their resistance to decay. Another fertile field lies in the securing of a strain of white pine capable of resisting the white pine blister rust. Other possibilities appear to be those of increasing tannin content of the bark of important tannin trees.

Dr. Craighead of the Bureau of Entomology has informed us that his appropriation for the development of Forest Insect Investigations was lost in the Congressional conference committee. This will retard development of the work he had outlined for placing forest entolologists at the forest experiment stations.

Dr. Hartley brought us news of a $6,000 increase in the item for chestnut blight work. Mr. Gravatt will have a force of men on scouting work in the Appalachian region this year. This may be supplemented by an additional $3,000 which the Office of Blister Rust control is securing from people interested in the tannin industry. The blight has now been found in the Cherokee Forest, and it appears probable that spot infections occur now throughout the entire range of the chestnut.

DENDROLOGY

Federal Horticultural Board Activities

During its existence for 12 years the Federal Horticultural Board has promulgated some 24 plant quarantines against foreign countries for the protection of American horticulture and forests against injurious insect pests and plant diseases. Against the spread of dangerous insects and diseases, already here, to uninfested sections of the United States, the Board has promulgated some 15 domestic quarantines. In addition to these foreign and domestic measures, the various states have promulgated a large number of quarantines designed to protect their own plant industries from insects and diseases likely to be brought in by plants and plant products from other states through interstate commerce. Throughout the existence of the Board there has been in general close and effective cooperation of State and Federal Board officials in safeguarding the interstate movement of plants and plant products likely to carry injurious insects and diseases. Nevertheless, some states, fearful of certain insect and disease invasions, not yet within their borders, have issued complete embargoes against certain other states, not deeming it wise in all cases, even under Federal certificate of cleanliness, to admit plants or products from states known to have infested areas within their borders. An example of such action is an embargo by Georgia against nursery stock from states containing areas infested with the Japanese beetle. This multiplying of state embargoes has in some cases curtailed the nursery trade of states having beetle-infested areas within their lines with states outside, in some instances large financial losses resulting. In

situations like this, the difficult task of the Board has always been to efficiently protect agriculture and horticulture against plant diseases and insect pests, without unnecessarily interfering with trade relations.

In order, therefore, to thoroughly examine into the question of state quarantines in their relation to Federal measures from this point of view of adequate protection, the Board invited all the state quarantine officers of the country to participate in a conference in Washington, held April 28-30. Purposely, the Board asked that the conference be organized for the session without reference to the Board's leadership, the desire on the Board's part being that the results obtained be secured by the state constituents, with the deliberations of whom members of the Board took a cooperative part only.

After an exhaustive discussion of important quarantine principles and trade interests involved, the conference developed the basis for broad understandings and agreements which would largely eliminatecfuture conflicting action between Federal and State quarantine officials and bring about closer cooperation. Throughout the conference there was manifested the fullest willingness on the part of these officials to take such action as would in the future harmonize or bring into alignment all Federal and State plant quarantine activities.

At the end of the general discussions, the conference appointed members of the Board and five state officials a committee to prepare recommendations embodying the judgment of the conference with respect to the various subjects discussed. The report of this committee was unanimously adopted by the conference.

As a direct result of, and in compliance with agreements reached by this conference, a considerable number of state quarantines, in more or less conflict with Federal quarantines, have been removed, or modified so as to eliminate conflict. State action is not to be taken now when Federal action adequately safeguards a situation. Moreover, it is agreed now that, instead of acting independently, as in the past, a state considering quarantine action, of interest to another state, shall in advance send notice of such contemplated action to the Board, to quarantine officers of other states, and to others in interest. Likewise, when such action has been taken, or when a state has enacted new legislation as a basis of future quarantine action, notice of these facts similarly shall be promptly communicated to Federal and State officials in interest.

THE EDITOR'S OFFICE

One victim of the blue pencil has sent in a number of questions in the hope of securing answers that will help him to "get a manuscript by without a lot of blue-penciling." Extravagant hope! However, question and answer is a good method of getting facts out in the foreground, and since the questions are presented, the answers should be forthcoming.

Question 1 is: How should a table be constructed? This has already been answered, at least in part, in the February-March Report.

2. What of the numbering of plates and figures, and what is a text figure?

Answer: Plates are numbered in Roman numerals, figures in Arabic. There are two sorts of numbered figures. One is a plate figure, or photograph appearing with one or more others on the same page. The other is a line-cut figure or graph, drawing, or chart. Where two photos appear on the same page, they are numbered as follows in the text: "Plate XI, figure 1" and "Plate XI, figure 2." If the reference is not part of the text but is inserted in parentheses, it should read: "(Pl. XI, fig. 1)" or "(Plate XI, figs. 1 and 2)." These figures are numbered separately 1, 2, and so on, for each Plate. Line-cut figures, whether graphs or drawings, are numbered consecutively for the whole article, as are tables. A chart or graph, by the way, should be as nearly as possible complete in itself. That is to say, with the caption and legend and the designations upon the chart itself, it should be possible for the casual reader of your publication to understand what it is about and get at least a general idea of what the chart is proving.

A text figure is a figure without caption or legend that merely illustrates the immediate contect. For example, with the statement that certain plotted values give a curve of asymptotic form, a text figure might at that point give an asymptote, without specific values, merely as an illustration. A text table is similarly material in tabular form that has no number or title and the very simplest form of headings. It might be merely to illustrate how certain data were tabulated, or to list in more convenient form some simple enumeration of values by years or classes that might be less easily assimilated as text material. If, however, such data is to be referred to later, or has any importance outside of the immediate context, it should be numbered as a regular table.

3. How should literature references be written in the text?

Answer: As described in pages 2 and 3 of the November report, and further treated in the December report.

4. Under what circumstances may italics be called into play?

Answer: Italics are like the red tag marked "RUSH!" As soon as they are used with any frequency, they lose all value. They are overused by the person who has not sufficient confidence in his ability to make the English language express what he has to say. I do not believe that any literary or scientific work ever suffered for the lack of italics where they were not demanded by typographical rules. I should say that they may be legitimately called into play where the author feels confident after second and third thought that they improve the MS. In that case it is safe to try them on the editor and see if he thinks so too.

5. Who is to have the last say as to whether an idea is correctly expressed?

Answer: In 99 cases the author. In the 1/100th case the editor, or possibly the Chief of Branch. The intention is to have the author's agreement on all changes. In some instances there are last-minute alterations that cannot very easily be referred to the author without serious delay; but in such cases the galley proofs give the author his opportunity to remonstrate if he is not in agreement. In some cases in the past six months, MSS which the editor saw at the eleventh hour received alterations, and not invariably for the better, and these could not be referred to the author. Just as seldom as possible will this be done in the future, except in minor instances, or upon the request of the station or district that corrections be made without referring the MS back.

APPALACHIAN FOREST EXPERIMENT STATION

Forestation activities

The unusually cold, wet spring moderated sufficiently to permit Korstian to finish early in the month the spring seed sowing in the Station's seed beds at Canton. A number of exotics, the seed of which was supplied by various cooperators, are being tested on a limited scale. Because of the failure of the seed crop we have still been unable to secure seed of the native red spruce. Owing to the recurrence of cold cloudy weather during the month germination was just getting under way by the end of the month. Both the spring sowing of stratified yellow poplar seed and the fall sowing of the same species are germinating, the fall-sown seed being somewhat in the lead. Mr. A. H. MacAndrews, of the Bureau of Entomology, accompanied Korstian on his last trip to Canton. They were unable to find any indications of fresh work by the white pine weevil, which was quite prevalent in the white pine planted on Fibreville Hill last year by the Champion Fibre Company.

The plots in the planting experiments in the devastated spruce type on the slope of Clingman's Peak were staked permanently with pieces of iron pipe. A second trip was made to the planting area for the purpose of making the spring counts but rain interrupted the work early in the day.

Methods of Cutting

Korstian and MacAndrews completed the work of releasing the yellow poplar reproduction begun last fall by Frothingham and Korstian on two half-acre plots adjacent to Lookingglass Rock in the Pisgah National Forest. Reproduction plots were also established on each of the larger treated plots and on the controls. The stumps of the chestnut and silverbell cut last fall were already sprouting vigorously. It should

also be noted that several additional chestnut blight infections were found on these plots. Within a few years these plots will be very valuable, not only from the standpoint of the release of the overtopped young poplar, but also in connection with chestnut conversion problems.

Frothingham and Haasis left for Berea, Kentucky, on the 28th to resume work on the permanent sample plots laid out last summer by Frothingham in cooperation with Berea College.

Cooperation in Forest Entomology

We were very glad to welcome Dr. Craighead and Mr. A. H. MacAndrews, of the Bureau of Entomology, who started studies of insect injury to the yellow pines at Bent Creek in the Pisgah National Forest. Mr. MacAndrews will continue these studies during the summer.

Personnel

McCarthy left the first of the month for 6 weeks detail to the Washington office. The absence of both McCarthy and Reineke has necessitated a number of changes in the plans for the spring activities of the Station.

General

The greater part of Frothingham's time was spent in work connected with the opening of the field season and in other administrative and routine matters.

The station received visits from Mr. B. H. Paul of the Forest Products Laboratory, who collected hickory in this locality in connection with his study of the physical properties of wood as influenced by growth conditions, and from Mr. John B. Cuno of the Washington Office of Products. Mr. Cuno was collecting information on the utilization of dogwood.

Advantage was taken of the visit of Mr. Brent S. Drane, Director of the North Carolina Geological and Economic Survey, and Mr. J. S. Holmes, State Forester of North Carolina, to discuss the chestnut replacement study. It is possible that the State will cooperate in this study.

Haasis revised the grazing damage working plan to provide for an economic study of the grazing situation in the Southern Appalachian region as a basis for determining the course which further work on this project should take.

FREMONT EXPERIMENT STATION

The month of May has been spent by Roeser entirely at the station, the principal activities being the planting of about 45 lots of yellow pine seedlings grown from seed which represent different crown classes in the yellow pine forest, and the transplanting in the nursery of similar lots of Douglas fir. There has also been activity on a small scale with spruce seedlings which were planted in the field under semi-nursery conditions, because of the very small size of the stock. Considerable time has also been spent on seed tests of the 1923 crops in the seed-production studies and on the watering and observation of pans which represent a new and more comprehensive test of the water requirements of six species - these are pinon, western yellow pine, bristle-cone pine, lodgepole pine, Douglas fir and Engelmann spruce. Both Colorado and Arizona yellow pine have been sown because of varietal differences shown by these in a previous test and the desire to record in a simple way the possible extent of such variations within the species. Each species has been sown in 5 kinds of soil, varying primarily in chemical reaction, in order to bring out the effect of the soil factor on the growth rate and water requirement.

Some time was spent by Bates at the beginning of the month in preparing the soil and in initiating the tests just described. From May 12 to 26, inclusive, Bates was on the San Juan Forest with Mr. Douglas of Grazing and Mr. Johnson of Planting and local forest officers, attempting to survey the extent of and the causes for grazing damage to reproduction in the yellow pine type. The clear-cut conclusion has been that this damage is quite largely confined to the early spring range which is almost universally overgrazed. The grazing and the silvicultural problem, therefore, go hand in hand. But a small portion of the spring range thus overgrazed is National Forest land, and the higher portion of the yellow pine type within the Forest is not suffering, although reproduction is not as abundant as in the Colorado foothills type or in the Black Hills, because of the very heavy character of most of the soil on the San Juan.

During this survey, 5 sample plots were established which it is expected will give a measure of the invisible damage from grazing under a variety of conditions. It was considerable of a surprise to the writer to find that damage by cattle grazing could be just as severe as the damage by sheep grazing under the right conditions.

During this trip, also, a beginning was made on the increment study of cut-over yellow pine stands under the general project ME-6. An unusual opportunity presented itself to establish a trio of permanent sample plots in a well-stocked yellow pine forest and, while this group alone will not be representative of the entire yellow pine type of the San Juan, it will permit a comparison of growth in that region with optimum growth conditions under very different soil conditions in District 3.

June Plans

Roeser's time during June will be spent at the station and will be widely distributed between a number of activities on the current projects, including the lodgepole source-of-seed experiment, the transpiration or water-requirements test, a field test of the heat-resistance of seedlings of the various species, and mapping and measurement of the cutting areas on the station grounds. Rangers Robertson and Gibbs will be busy as usual with maintenance work. It is probable that Ranger Gibbs, who has been extra since Robertson's return in February, will be transferred about July 1 to regular forest work. Aside from a few days of supervision of the station work, Bates will be on the Black Hills and Harney Forests during almost the entire month. The regular 5-year remeasurement of yellow pine thinning plots is the primary consideration in this trip, but it is expected also to extend this project by the installation of additional plots, to initiate the increment study of cut-over areas, and to investigate the problem of grazing damage and install plots in the same way as has been done on the San Juan.

LAKE STATES FOREST EXPERIMENT STATION

An unusually late spring delayed starting field work for nearly a month. The field work did get under way, however, early in May, although reports now coming from the field still indicate raw, cold weather with occasional snow.

The yield study of jack pine is now being conducted in the vicinity of Solon Springs, Wisconsin. In this study the Conservation Commission of Wisconsin is cooperating to the extent of one technical man. The party consists of Wackerman, F. G. Wilson of the Wisconsin Conservation Commission, and H. C. Mitchell, a temporary field assistant from the University of Michigan.

The working plan for the reforestation study of the region has been completed and submitted to Washington. Kittredge is now in the field, his present work being confined to the State of Minnesota.

Mitchell has started his work on the analysis of fire data and has the help of Herbert F. Maturen, a temporary field assistant from the University of Minnesota. Mitchell is also in the field, locating some central points for taking continuous psychrometric records.

The most outstanding fact of this month was the meeting of the Advisory Committee in Duluth on May 19. Except for the Upper Peninsula Development Bureau, the representative of which is now in Europe, all the organizations were represented by the regularly appointed delegates, or, in some cases, substitutes. In addition to the delegates there were several guests, such as President Coffman of the University of Minnesota, Dr. H. P. Baker, and Mr. Rudolph Weyerhaeuser. District 2 was represented by two men, C. A. Hoar and E. W. Tinker, and the Washington office by Mr. Clapp, Mr. Eldredge and Mr. Peters.

All the projects submitted to the Advisory Committee for consideration were approved. These are as follows: 1. Studies leading to more effective forest protection:

a. Analysis of available forest fire data to determine the normal occurrence of forest fires as to time and place; prevailing causes; effect of date of occurrence, character of cover, speed of attack, etc., on number, size, and severity of fires; as a basis for more effective organization of the protective forces.

b. Relation of weather conditions to the occurrence, size, and severity of forest fires as a basis for forecasting emergency conditions.

2. A review of work already done in the Lake States along reforestation lines to determine the most practicable methods of reforestation, the most promising species, the cost, and the returns to be expected; as a basis for future State and private reforestation enterprises.

3. Studies of the present and possible yield of second growth jack pine and hardwood stands; as a basis for determining their value and importance as a source of future timber supplies.

4. Studies to determine the best method of handling virgin beech, birch and maple, and swamp forests to secure the highest yield and to keep them continuously productive.

a. Selection vs. clear cutting.

b. Cost and results of various methods of slash disposal.

c. Effect of drainage on growth and yield of swamp forests.

5. Thinning studies in jack pine to determine the possibilities of increasing yield. (Cloquet Forest Experiment Station.)

6. Studies of forest insect pests, and methods of control. (In cooperation with Bureau of Entomology and University of Minnesota.)

7. A study of the value of forest litter as a factor in soil fertility and the deteriorating effect of forest fires.

8. Incidental to the above the station is interested in various economic problems such as the relation of forestry to agricultural development, forest taxation, and the development of forestry in the region, although no specific projects along these lines can be undertaken at this time.

The committee appointed by Dean Coffey, including the Director of the Station, to recommend increased activities of the University in forest matters submitted its report.

Addresses during the month:

Gown in Town Club. May 6, Minneapolis. "The Forest as a Historic and Geographic Factor."

Editor's Short Course at the University of Minnesota. May 8. St. Paul.

Rotary Club, Kalamazoo, Mich. May 13.

Lansing Chapter of Hoo Hoo. Lansing, Mich. May 14.

CLOQUET FOREST EXPERIMENT STATION

A class of 12 students from the Minnesota Forest School finished six weeks' field work at the Cloquet Forest. They covered nearly a section of land, made a 100 per cent cruise, and a map of the area covered. The plan is to use the students in the regular course of forest regulation to secure the necessary data for a complete working plan for the Cloquet Forest.

An important meeting of all the county agents of northeastern Minnesota was held at Cloquet on May 13-14. The purpose was to acquaint the county agents with the forest problems and wood-using industries. The meeting was extremely successful and the county agents decided to have a Farmers' Day at the Cloquet Experiment Station.

On May 19 the members of the Advisory Committee visited the Experiment Station and looked over the wood-using industries at Cloquet.

The month of May was a busy time in shipping nursery stock and in transplanting. Nearly 450,000 seedlings were transplanted. The seeding of new beds will be started at the end of this month or early in June. This spring is unusually late.

The first portal marking the entrance to the station has been erected. Boundary and other signs for posting the Forest have been made. The signs are maroon and gold, which are the University colors.

Hansen spoke before the convention of Women's Clubs at Duluth, May 6. The station also prepared an exhibit for the same meeting.

NORTHEASTERN FOREST EXPERIMENT STATION

Considerable progress was made on the field work for all of the projects in the southern part of the region. The field work was practically completed on the two studies at the Massachusetts Agricultural College Forest at Mount Toby on hemlock growth and the comparative development of Scotch pine stock from different sources. Very detailed records, accompanied by maps, are being kept in each case. Meyer also put in some permanent sample plots on recently burned areas at the Simsbury State Forest, Connecticut, to determine the damage caused by fires in Connecticut sprout hardwood forests and the subsequent development of the burned-over areas.

Office work was continued and in large part completed for all of the projects that have been under way during the winter. Meyer and Bowman left the middle of May for field work in Maine on the spruce growth and yield study, and were joined later in the month by Max Shapiro, a University of Maine senior, on temporary appointment as field assistant. Westveld left the last day of the month for the White Mountain National Forest in New Hampshire for field work on the spruce methods of cutting study.

Dana went over with Supervisor Yarnall the possibility of establishing a substation on the Swift River drainage in the White Mountain National Forest. The only building available for the purpose would cost so much to put in shape as to make it seem inadvisable to attempt doing anything with it at this time. The White Mountain National Forest will, however, be made a center of work by the establishment there this summer of a number of permanent sample plots. Dana also visited the New York Conservation Commission, Cornell University, and the New York State College of Forestry for the purpose of getting more closely in touch with the work there and of discussing possible cooperation. While at Cornell a talk on forest research was given to the Forest Club.

PRIEST RIVER FOREST EXPERIMENT STATION

May stands out for us chiefly in the progress accomplished in getting out a considerable number of small and large reports which various members of the staff have been engaged upon during the last two months. Altogether 26 manuscripts were handled during the month, including two working plans, 10 reports for publication, and remaining group of progress and final reports not for publication. These various reports deal with our major projects, as well as with a number of long-standing forestation projects conducted at Priest River. It is a relief to be able to get these reports off and to know that the Branch is handling them so promptly.

It is also gratifying to know that the Journal of Agricultural Research is favorably disposed to taking more of our material. The results of much of our research suffer for the lack of media of publication. Some of it is not adapted for either the Journal of Forestry or Ecolocy, for one reason or another, probably because it has not an ecological bearing, or because it has not interest enough for practicing foresters. probably much of this material is in the nature of pure research rather than applied research. But these results have a distinct though restricted usefulness and should be published. The Priest River Station has perhaps a half dozen subjects of this sort that have lain in the files and that are now being considered for the Journal of Agricultural Research. They deal chiefly with such matters as physiological factors of site based on years of instrumental record, and also with forestation subjects connected with delayed germination, root development, and so on.

The office work on the western white pine yield study, with which the time of one man has been taken all winter, came to an end this month. The most interesting feature of the report is its preliminary yield table for three sites. It is based on 57 plots. Although these are not small plots, such as have been commonly taken in other regions, they admittedly do not make a sufficient basis. There are no plots under two acres in size and most of them are four acres and larger. More plots are to be taken this summer and a considerably larger number of Rockwell's plots (taken in his yield study 10 years ago) will be used after checking in the field. The reason for the failure of Rockwell's yield tables seems, from our scrutiny of his work, to lie not only in the fact that he took the best stands he could find and meandered their boundaries to be certain he included only the best, but also because he apparently used volume curves of unusually high value and based on the best selected trees within the plots. The present tables are based on stands neither visibly over nor understocked. Plots varying more than 15 per cent above or below the standard taken were discarded.

The present preliminary yield table gives figures which appear to represent very well the actual yields of naturally and fully stocked stands in the white pine type, in the light of our experience with timber sales. The present figures for Site I show 77,500 board feet per acre at 150 years, and those of Rockwell, 135,000 board feet. The present figures show 55,800 board feet per acre at the same age on Site II and those of Rockwell show 101,000. The data from the various plots show that the culmination of the mean annual volume growth per acre falls at about 110 years. The yield shown at this age is 64,000 board feet per acre for Site I, 46,500 for Site II, and 28,700 for Site III.

The field work on the yield study this year will be devoted chiefly to an investigation of methods of application of normal yield. It is believed that the correction factors must be based on the principle of tendency toward normality. Our plan for studying this tendency through the different age classes and by various densities is outlined in the working plan recently forwarded to Washington.

The month of May witnessed the beginning of field work for most of the staff. Wahlenberg and Kempff were engaged in the field the whole month, Gisborne left for the field station about May 15, Haig assisted Wahlenberg in field examinations for a week early in May, and Larsen and Haig departed for Priest River this week. Weidman plans to leave before the month is out.

Larsen's proposed bulletin on "Silvicultural Practice in Montana and North Idaho," upon which he has done hard work this month, is in revised form for review by Weidman. It is hoped to get it off to Washington in June.

Gisborne reported extremely dry conditions and numerous serious forest fires during his first days in the field. April and May have been unusually dry this year. Wahlenberg's weather records at Savenac this year show 0.01 inch of rain for the first three weeks of May. Fires escaping from slash burning and brush burning by ranchers have been the chief cause of the numerous conflagrations. Fires ranged from several hundred acres to 10,000 acres in one case. From the statistical study of weather in past spring seasons, and from Father Ricard's monthly forecast, Gisborne was able early in May to appraise the situation pretty accurately. Upon his information the District Office issued a circular letter of warning to the Supervisors. One interesting feature of the situation is that Father Ricard's forecast for May, from the observatory at Santa Clara University, checked out remarkably well, as it has repeatedly during the two years Gisborne has been checking it against the actual weather. This monthly forecast included protracted clear weather without rain until the beginning of the fourth week of the month when a decided atmospheric depression was forecast for the Northwest with considerable cloudiness and rain. This has been the actual weather this week. Rain has fallen over most of the District. At Priest River 0.47 of an inch fell on May 24 and more later.

The month of May has been one of the busiest of the year for Wahlenberg. With the part-time help of three temporary assistants (including Haig's detail for 7½ days' work) the bulk of the forestation work planned for this spring has progressed very satisfactorily. This is also partly due to the fact that at no time has stormy weather interfered with the work. There has been activity in connection with the experiments in the nursery, the laboratory, and at two points in the field. On the major project (to overcome low field survival) slightly over 9,000 yellow pine seedlings and transplants have been planted. This stock was so prepared and set out in the field as to afford comparisons of three root lengths, three size classes, two age classes, and two site qualities. Examinations at intervals throughout the season are planned. Laboratory measurements on 660 plants representative of these tests have been taken. Haig's assistance was timely in securing the spring examinations of some 13,000 trees previously planted. Most of these were the experimental plantations of 1923 and a few were of the 1922 plantings.

In the nursery twenty small plots were installed to test a second application of our weed eradication treatment on soil originally treated two years ago. Half of these were sown with white pine and the other half with yellow pine. Twelve plots in six standard beds were also sown to these species in a test of soil texture and fertility of different layers as a possible means of controlling the development of root systems. In another standard bed some Japanese tree seeds recently received were sown. The species are Chamaecyparis pisifera, Abies sachaliensis, Picea ajanensis, and Larix leptolepis. A solution of sodium nitrate in four different strengths (as a fertilizer to stimulate growth of Engelmann spruce) was applied to 2-0 spruce beds as suggested at the last District investigative meeting.

The weather and the local country at Savenac is dry. April was 0.47 subnormal in precipitation. The local normal for May is 1.84 inches and so far only 0.01 has been received this month. The new plantations are already feeling the drought.

At the field station, Kempff was engaged in the usual variety of work falling to the lot of the resident officer. The first part of the month was spent on slash disposal on the Fox Creek sale. Nearly a week was devoted to the model plantation of about 12 acres, which it was hoped to complete this spring. Unfortunately, the weather conditions became so dry and forest fires in the vicinity interrupted Kempff's time to such an extent that the planting could not be completed, the stock temporarily being transplanted. Three and a half days were spent fighting forest fires with the local district ranger. About 10 days were spent on maintenance work connected with telephone lines, the weather station, and the repair of fences and improvement of the grounds. Visitors to the field station during the month included Messrs. Alexander and Keyser of the Weather Bureau, Forest Supervisor Fitzwater of the Kaniksu Forest, W. W. White and R. B. Adams of the District Office.

In addition to the articles listed in the Manuscript News Notes in the April issue and the present, the station has to its credit the following:

Study of Natural Reproduction after Fires (Progress Report). J. A. Larsen.

Length of Fire Seasons at Different Elevations in Idaho. J. A. Larsen.

Working Plan for Study of Methods of Cutting Western White Pine. J. A. Larsen.

Working Plan for Study of Application of Normal Yield Tables. I.T.Haig.

Growth and Yield of Western White Pine (Progress Report). Larsen and Haig.

SOUTHWESTERN FOREST EXPERIMENT STATION

Dry weather during the month of May has afforded a good opportunity to examine sample plots and cutting areas. Considerable apprehension was felt regarding windfall on sample plots. A strong wind in December levelled most of the seed trees on some sections west of the San Francisco Mountains. The two sample plots west of the station which have furnished so much information on reproduction and growth in recent years lay right in the course of the storm; but evidently it had spent its fury before reaching them, because the windfall is little if any above normal. Only one cut-over plot in the entire series established by the Experiment Station was hard hit. Great loss was experienced in the virgin timber right at the station. The trees had been tagged 8 years ago with the idea of furnishing data on growth and loss in virgin stands. It is estimated that nearly 100 trees went down on this quarter section.

Studies of the windfall on recently logged areas where losses were extremely heavy indicate that the loss could not have been lessened by any modification of the marking method. Trees of all ages, sizes and conditions went down. On two sections west of the San Francisco Mountains the ground is as clear as a private cutting. On the south edge of Hart Prairie entire groups of veterans which have weathered the storms for centuries were laid low.

Mr. M. Juhlin-Dannfelt of the Swedish Forest Service and a student under the Scandinavian-American Foundation spent 10 days at Fort Valley. Advantage was taken of his visit to acquire a working knowledge of Jonson's universal volume tables.

On June 27, Pearson gave a talk on growing trees, shrubs and vines, at a "Civic Pride" meeting in Flagstaff.

DISTRICT 5 - CALIFORNIA DISTRICT

Dunning and Ayres started field work on the Stanislaw Forest early in May. The work accomplished there consisted of detailed mapping of the permanent sample plots established a year ago, examination of reproduction strips established by Munns in 1921, and inaugurating the work of the special volume table party which is being financed by Forest Management. The map of the permanent plot is eloquent proof of the degree to which modern power logging tears up the ground and reduces the amount of reproduction and even larger trees during the process of exploitation. On this particular area, too, the map shows that practically all the skidding trails run straight in from the woods to the machine and that no apparent effort was made to pull around established clumps of reproduction. The reproduction strips, though established three years ago, are still only partially cut over, and it will be another year in all probability before they have been completely covered.

Show was on the Plumas Forest for about a week with Forest Entomologist John M. Miller, examining the Snake Lake light burning area and reburning a small part of the area. It had been hoped to completely reburn this 200-acre experiment, but the prolonged drouth had made this impossible. The trip with Mr. Miller was well worth while and plans were made for more thorough and adequate study of the interrelation of insects and fire than any that have been in existence before. Following the burning, work was started on the re-measurement of the Luman yield plot on the Plumas Forest by Show and Dunning. The first work done consisted in climbing and measuring for taper the trees that were first measured five years ago. The balance of the work on this and other plots in the vicinity will probably be completed by the end of the month.

LIBRARY

In May the library loans of books and periodicals amounted to 913, and 110 members of the Service and others consulted the library in person. There were 226 books and articles indexed for the library catalogue during the month.

MANUSCRIPT NEWS NOTES

Southwestern

Acceleration of growth of western yellow pine stands after cutting. Hermann Krauch (Journal of Forestry).

Comparison between tape and caliper measurements. Hermann Krauch. (Journal of Forestry.)

Some conditions for effective research. G. A. Pearson. (Science.)

Determination of increment in cut-over western yellow pine stands in Arizona. Hermann Krauch. (Revised: Journal Agricultural Research.)

Priest River

Influence of Forest Cover on Streamflow. H. T. Gisborne. (Engineering News.)

A Method of Controlling Root Systems of Planting Stock. J. A. Larsen. (Progress Report.)

Germination and Survival of Native Species on Different Surfaces Found on a Logging Area. J. A. Larsen (Progress Report.)

Root Development of Western White Pine Stock Planted by Different Methods. J. A. Larsen. (Progress Report.)

Burned Highways and Green. H. T. Gisborne. (Highway Magazine.)

Classes of Stock for planting western Yellow Pine. J. A. Larsen. (Final Report.)

Plantations of Norway Spruce, Norway Pine, Scotch Pine, European Larch, Austrian Pine, Eastern White Pine. J. A. Larsen. (Progress Repts.)

Fall Sowing and Delayed Germination of Western White Pine Seed. W. G. Wahlenberg. (Journal.)

Root Hairs and Zones of Absorption in Pine Nursery Stock. W. G. Wahlenberg. (Jour. Agric. Research.)

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Classes of Stock for Planting, Western White Pine. J. A. Larsen. (Final Report.)

Factors Affecting Reproduction After Logging in Northern Idaho. J. A. Larsen. (Journal Agricultural Research.)

Lake States

Annual Report of the Cloquet Forest Experiment Station for 1922. T. S. Hansen. (Cloquet.)

Appalachian

New Forests for Cut-over and Burned Spruce Lands in the Southern Appalachians. E. H. Frothingham. (Official Record.)

Research to aid timber growing in the Southern Appalachians. (Southern Agriculturist.)

Fremont

Forest types in Central Rocky Mountains as affected by climate and soil. C. G. Bates. (Dept. Bulletin 1233. Page proof.)

Relative resistance of tree seedlings to excessive heat. Bates and Roeser. (Dept. Bul. 1263. Galley proof.)

Southern

Some National Aspects of the Forestry Situation. R. D. Forbes. (Lumber World Review.)

Naval stores tests in slash pine. L. Wyman. (Progress Report.)

Naval stores tests in longleaf pine. L. Wyman. (Progress Report.)

Effect of seasonal burning in second growth longleaf pine, sapling stage. W.R.B.Hine. (Progress Report.)

District 4

A new method of constructing taper curves. F. S. Baker. Final revision. (Journal Agricultural Research.)

Aspen in forest management. F. S. Baker (Bulletin; revised manuscript to printer.)

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District 5

Prediction of the second cut in National Forest management plans. Duncan Dunning. (Journal Agricultural Research.)

Weather Conditions and forest fires in California. S. B. Show and E. I. Kotok. (Monthly Weather Review.)

Washington Office

Revision, Form 446 (4 parts.)

The Madison Conference. (to mimeograph.)

In Print

F. W. Haasis. A Chance for Reforestation. American Forests and Forest Life. 298-300. V. 30. May 1924.

C. G. Bates. Windbreaks as a Farm Asset. Revision of Farmers' Bulletin 788.

W. G. Wahlenberg. Circumventing Delayed Germination in the Nursery. American Lumberman, May 3, 1924.

J. A. Mitchell. Timber of Upper Peninsula is Cash Crop. Development Bureau News, May 1, 1924.

A. E. Wackerman. The last stand of Michigan's Primeval Forest. Detroit News, May 18, 1924.